

APPENDIX D:

**AIR QUALITY MONITORING DATA IN THE UNITED STATES
AND MEXICO BORDER REGION**

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Ambient air quality data nearest the proposed transmission lines are collected at air quality monitoring stations in El Centro and Calexico, California, that are operated by the Imperial County Air Pollution Control District. The El Centro monitoring station is located at 150 9th Street, about 10 mi (16 km) northeast of the Imperial Valley Substation; the monitoring station in Calexico nearest the project area is at 900 Grant Street, about 12 mi (19 km) east of the proposed transmission lines border crossing. The 9th Street station measures ozone (O_3), carbon monoxide (CO), and particulates. The Grant Street station measures O_3 , particulates, and noncriteria pollutants. Two other air quality monitoring stations are located in Calexico; the Ethel Street station is located at 1029 Ethel Street, and the Calexico East station is opposite the border checkpoint on Highway 111. Each of these stations monitors O_3 , particulates, CO, nitrogen oxides (NO_x ; measured as nitrogen dioxide [NO_2]), sulfur dioxide (SO_2), and noncriteria pollutants.

Ambient air quality data are also collected in Imperial County at monitoring sites that are farther from the project area. These are Brawly Main Street, Westmorland West 1st Street, and Niland English Road, approximately 19, 20, and 40 mi (31, 32, and 64 km) northeast of the project area, respectively. Within the Salton Sea Air Basin as a whole, two additional monitoring sites are located in Riverside County at Indo Jackson Street and the Palm Springs Fire Station approximately 60 and 80 mi (97 and 129 km) northwest of the proposed transmission lines, respectively. These data are not reported here because of the distances of these sites from the proposed transmission lines.

The Secretaría del Medio Ambiente y Recursos Naturales (SEMARNAT [the Mexican Environmental Agency]) also collects ambient air quality data at 10 monitoring sites in Mexicali immediately south of Calexico across the United States-Mexico border. These sites are also designated as California Air Resources Board (ARB) sites. They are loosely clustered within an approximate radius of several miles and generally lie 11 mi (18 km) east of the southern end of the proposed transmission lines and 8 mi (13 km) east of the Termoeléctrica U.S., LLC, and Baja California Power, Inc., power plants that supply power to the transmission lines in the project area. All 10 sites collect particulates and noncriteria pollutants, and four collect CO, NO_x (measured as NO_2), O_3 , SO_2 , particulates, lead, and noncriteria pollutants. These four are located at the Instituto Tecnológico de Mexicali (ITM), Universidad Autónomos de Baja California (UABC), El Centro de Bachillerato Tecnológico Industrial y de Servicios (CBTIS), and Colegio de Bachilleres (COBACH). Figures 3.3-12 and 3.3-13 in the environmental impact statement show the locations of monitoring sites operated in 2001 through 2003 that are located in the United States and Mexico border regions, respectively, including those described here.

Tables D-1 through D-8 show a cross section of annual data on criteria air pollutant measurements from 1988 to 2001 at the four monitoring sites in El Centro and Calexico in Imperial County and at the four monitoring sites in Mexicali described previously (ITM, UABC,

CBTIS, and COBACH). Measurements in the United States were made on behalf of the ARB, and in Mexico on behalf of SEMARNAT. These tables were abstracted from a larger summary database of border air quality maintained by the U.S. Environmental Protection Agency (EPA), Technology Transfer Network, U.S.-Mexico Border Information Center on Air Pollution (CICA: Centro de Información sobre Contaminación de Aire) (EPA 2003).¹

The tables show the annual means of 1-hour measurements of CO, NO₂, O₃, and SO₂ recorded in each year at each site. Also shown are annual means of 24-hour measurements of particulate matter with an aerodynamic diameter of 10 µm or less (PM₁₀) that were generally made on an approximate 5-day cycle, although irregular sampling gaps also occurred. Measurements of criteria pollutants were not made every year at all of the sites listed, nor are they yet available in summary form in the CICA database. Annual arithmetic means, annual geometric means, highest annual values, and the number of observations for each air pollutant made in any year are listed.

REFERENCE FOR APPENDIX D

EPA (U.S. Environmental Protection Agency), 2003, “Summary Database of Border Air Quality,” prepared by Centro de Información sobre Contaminación de Aire (CICA), Para la Frontera entre EE. UU. y México, maintained by EPA Technology Transfer Network, U.S.-Mexico Border Information Center on Air Pollution.

¹ This database was prepared by CICA from data retrieved from the EPA Aerometric Information Retrieval System (AIRS) on January 1, 2002. The EPA has since changed the AIRS to a database that is solely related to tracking the compliance of stationary sources of air pollution with EPA regulations. The Air Facility Subsystem (AIRS/AFS) information is available at <http://www.epa.gov/Compliance/planning/data/air/aboutafs.html>.

**TABLE D-1 Annual Criteria Pollutant Monitoring: Calexico,
1029 Ethel Street, Calexico High School**

Year	Arithmetic Mean	Geometric Mean	Highest Value	Number of Observations
CO 1-hour measurements				
1994	1.14 ppm	0.58 ppm	30.6 ppm	4,710
1995	1.22 ppm	0.59 ppm	32.0 ppm	8,289
1996	1.06 ppm	0.54 ppm	27.0 ppm	8,106
1997	1.05 ppm	0.55 ppm	24.0 ppm	8,306
1998	1.06 ppm	0.59 ppm	23.5 ppm	8,214
1999	1.13 ppm	0.62 ppm	22.9 ppm	8,281
2000	1.11 ppm	0.60 ppm	19.9 ppm	7,122
NO ₂ 1-hour measurements				
1994	0.0149 ppm	0.0090 ppm	0.227 ppm	4,770
1995	0.0158 ppm	0.0054 ppm	0.217 ppm	8,334
1996	0.0143 ppm	0.0034 ppm	0.164 ppm	8,342
1997	0.0152 ppm	0.0092 ppm	0.128 ppm	7,569
1998	0.0143 ppm	0.0093 ppm	0.257 ppm	5,463
1999	0.0178 ppm	0.0122 ppm	0.286 ppm	8,205
2000	0.0186 ppm	0.0126 ppm	0.192 ppm	7,587
O ₃ 1-hour measurements				
1994	0.0574 ppm	0.0529 ppm	0.125 ppm	4,795
1995	0.0616 ppm	0.0572 ppm	0.232 ppm	8,339
1996	0.0622 ppm	0.0583 ppm	0.146 ppm	8,381
1997	0.0557 ppm	0.0518 ppm	0.156 ppm	8,321
1998	0.0620 ppm	0.0590 ppm	0.139 ppm	8,307
1999	0.0616 ppm	0.0581 ppm	0.171 ppm	8,319
2000	0.0569 ppm	0.0538 ppm	0.169 ppm	7,592
SO ₂ 1-hour measurements				
1994	0.0066 ppm	0.0036 ppm	0.060 ppm	4,052
1995	0.0052 ppm	0.0013 ppm	0.039 ppm	4,787
1996	0.0038 ppm	0.0016 ppm	0.036 ppm	7,826
1997	0.0028 ppm	0.0019 ppm	0.040 ppm	7,434
1998	0.0037 ppm	0.0024 ppm	0.035 ppm	7,359
1999	0.0028 ppm	0.0018 ppm	0.028 ppm	7,940
2000	0.0026 ppm	0.0018 ppm	0.026 ppm	7,595
PM ₁₀ 24-hour measurements				
1995	65.0 µg/m ³	55.7 µg/m ³	180 µg/m ³	56
1996	73.9 µg/m ³	62.4 µg/m ³	193 µg/m ³	61
1997	77.8 µg/m ³	70.2 µg/m ³	166 µg/m ³	61
1998	66.5 µg/m ³	58.6 µg/m ³	160 µg/m ³	61
1999	72.2 µg/m ³	66.4 µg/m ³	181 µg/m ³	58
2000	84.3 µg/m ³	73.0 µg/m ³	268 µg/m ³	61
2001	85.3 µg/m ³	74.9 µg/m ³	437 µg/m ³	46

**TABLE D-2 Annual Criteria Pollutant Monitoring:
Calexico, Calexico-East, U.S. Port of Entry**

Year	Arithmetic Mean	Geometric Mean	Highest Value	Number of Observations
CO 1-hour measurements				
1996	0.0065 ppm	0.0009 ppm	0.072 ppm	5,364
1997	0.0108 ppm	0.0061 ppm	0.091 ppm	7,708
1998	0.0114 ppm	0.0070 ppm	0.105 ppm	7,618
1999	0.0133 ppm	0.0083 ppm	0.110 ppm	8,319
2000	0.0120 ppm	0.0072 ppm	0.124 ppm	6,979
NO ₂ 1-hour measurements				
1994	0.0149 ppm	0.0090 ppm	0.227 ppm	4,770
1995	0.0158 ppm	0.0054 ppm	0.217 ppm	8,334
1996	0.0143 ppm	0.0034 ppm	0.164 ppm	8,342
1997	0.0152 ppm	0.0092 ppm	0.128 ppm	7,569
1998	0.0143 ppm	0.0093 ppm	0.257 ppm	5,463
1999	0.0178 ppm	0.0122 ppm	0.286 ppm	8,205
2000	0.0186 ppm	0.0126 ppm	0.192 ppm	7,587
O ₃ 1-hour measurements				
1996	0.0609 ppm	0.0570 ppm	0.162 ppm	5,365
1997	0.0540 ppm	0.0520 ppm	0.121 ppm	7,484
1998	0.0656 ppm	0.0620 ppm	0.236 ppm	8,093
1999	0.0632 ppm	0.0610 ppm	0.156 ppm	8,323
2000	0.0558 ppm	0.0541 ppm	0.108 ppm	6,979
SO ₂ 1-hour measurements				
1996	0.0018 ppm	0.0003 ppm	0.036 ppm	5,365
1997	0.0022 ppm	0.0013 ppm	0.035 ppm	7,487
1998	0.0031 ppm	0.0021 ppm	0.026 ppm	1,236
PM ₁₀ 24-hour measurements				
1996	112.7 µg/m ³	90.3 µg/m ³	441 µg/m ³	44
1997	86.8 µg/m ³	76.9 µg/m ³	199 µg/m ³	60
1998	106.5 µg/m ³	79.1 µg/m ³	568 µg/m ³	58
1999	167.1 µg/m ³	130.1 µg/m ³	1342 µg/m ³	55
2000	244.1 µg/m ³	182.9 µg/m ³	1613 µg/m ³	58
2001	200.9 µg/m ³	123.3 µg/m ³	1867 µg/m ³	41

**TABLE D-3 Annual Criteria Pollutant Monitoring:
Calexico, 960 Grant Street**

Year	Arithmetic Mean	Geometric Mean	Highest Value	Number of Observations
O₃ 1-hour measurements				
1998	0.0331 ppm	0.0307 ppm	0.090 ppm	1,690
1999	0.0583 ppm	0.0520 ppm	0.163 ppm	6,171

PM ₁₀ 24-hour measurements				
Year	Arithmetic Mean	Geometric Mean	Highest Value	Number of Observations
1992	57.3 µg/m ³	49.2 µg/m ³	208 µg/m ³	48
1993	58.8 µg/m ³	49.2 µg/m ³	253 µg/m ³	61
1994	76.1 µg/m ³	65.4 µg/m ³	182 µg/m ³	45
1995	58.0 µg/m ³	47.2 µg/m ³	195 µg/m ³	62
1996	74.5 µg/m ³	64.7 µg/m ³	187 µg/m ³	57
1997	74.0 µg/m ³	62.7 µg/m ³	179 µg/m ³	50
1998	64.2 µg/m ³	52.0 µg/m ³	176 µg/m ³	60
1999	77.2 µg/m ³	66.2 µg/m ³	227 µg/m ³	60
2000	96.3 µg/m ³	85.2 µg/m ³	252 µg/m ³	56
2001	79.5 µg/m ³	65.0 µg/m ³	510 µg/m ³	46

**TABLE D-4 Annual Criteria Pollutant Monitoring:
El Centro, 150 9th Street**

Year	Arithmetic Mean	Geometric Mean	Highest Value	Number of Observations
CO 1-hour measurements				
1996	0.67 ppm	0.42 ppm	12 ppm	8,784
1997	0.48 ppm	0.34 ppm	6 ppm	8,702
1998	0.55 ppm	0.39 ppm	7 ppm	6,858

O ₃ 1-hour measurements				
Year	Arithmetic Mean	Geometric Mean	Highest Value	Number of Observations
1992	0.0526 ppm	0.0479 ppm	0.12 ppm	7,966
1993	0.0629 ppm	0.0596 ppm	0.15 ppm	8,527
1994	0.0620 ppm	0.0579 ppm	0.13 ppm	8,384
1995	0.0601 ppm	0.0555 ppm	0.15 ppm	7,709
1996	0.0691 ppm	0.0660 ppm	0.14 ppm	7,100
1997	0.0628 ppm	0.0599 ppm	0.13 ppm	8,274
1998	0.0585 ppm	0.0562 ppm	0.13 ppm	7,685
1999	0.0681 ppm	0.0664 ppm	0.14 ppm	3,441

**TABLE D-5 Annual Criteria Pollutant Monitoring:
Mexicali, ITM**

Year	Arithmetic Mean	Geometric Mean	Highest Value	Number of Observations
CO 1-hour measurements				
1997	1.45 ppm	0.63 ppm	31.0 ppm	7,663
1998	1.50 ppm	0.67 ppm	27.5 ppm	8,081
1999	1.57 ppm	0.68 ppm	32.3 ppm	5,870
NO ₂ 1-hour measurements				
1997	0.0186 ppm	0.0117 ppm	0.146 ppm	7,314
1998	0.0200 ppm	0.0127 ppm	0.158 ppm	8,189
1999	0.0204 ppm	0.0124 ppm	0.169 ppm	5,765
2000	0.0212 ppm	0.0138 ppm	0.179 ppm	8,059
O ₃ 1-hour measurements				
1997	0.0629 ppm	0.0596 ppm	0.211 ppm	7,024
1998	0.0646 ppm	0.0615 ppm	0.155 ppm	8,082
1999	0.0614 ppm	0.0584 ppm	0.144 ppm	5,676
SO ₂ 1-hour measurements				
1997	0.0027 ppm	0.0004 ppm	0.048 ppm	7,405
1998	0.0024 ppm	0.0003 ppm	0.055 ppm	7,894
1999	0.0033 ppm	0.0004 ppm	0.045 ppm	5,717
PM ₁₀ 24-hour measurements				
1996	78.3 µg/m ³	70.1 µg/m ³	169 µg/m ³	12
1997	55.2 µg/m ³	50.5 µg/m ³	142 µg/m ³	51
1998	48.7 µg/m ³	41.9 µg/m ³	141 µg/m ³	58
1999	59.3 µg/m ³	51.8 µg/m ³	155 µg/m ³	61
2000	61.9 µg/m ³	54.6 µg/m ³	146 µg/m ³	58
2001	47.5 µg/m ³	41.3 µg/m ³	175 µg/m ³	36

**TABLE D-6 Annual Criteria Pollutant Monitoring:
Mexicali, UABC**

Year	Arithmetic Mean	Geometric Mean	Highest Value	Number of Observations
CO 1-hour measurements				
1997	1.75 ppm	0.74 ppm	40.0 ppm	6,678
1998	2.01 ppm	0.93 ppm	33.8 ppm	7,775
1999	2.14 ppm	0.95 ppm	36.1 ppm	8,150
NO ₂ 1-hour measurements				
1997	0.0210 ppm	0.0142 ppm	0.138 ppm	6,845
1998	0.0228 ppm	0.0163 ppm	0.169 ppm	7,507
1999	0.0248 ppm	0.0175 ppm	0.216 ppm	7,502
2000	0.0242 ppm	0.0171 ppm	0.191 ppm	7,473
O ₃ 1-hour measurements				
1997	0.0599 ppm	0.0554 ppm	0.171 ppm	6,208
1998	0.0551 ppm	0.0510 ppm	0.137 ppm	5,594
1999	0.0570 ppm	0.0525 ppm	0.143 ppm	7,495
SO ₂ 1-hour measurements				
1997	0.0041 ppm	0.0009 ppm	0.088 ppm	6,508
1998	0.0028 ppm	0.0005 ppm	0.078 ppm	7,518
1999	0.0036 ppm	0.0008 ppm	0.054 ppm	8,060
PM ₁₀ 24-hour measurements				
1997	98.0 µg/m ³	88.0 µg/m ³	231 µg/m ³	49
1998	82.6 µg/m ³	71.9 µg/m ³	190 µg/m ³	52
1999	88.4 µg/m ³	79.2 µg/m ³	285 µg/m ³	56
2000	96.8 µg/m ³	88.0 µg/m ³	276 µg/m ³	57
2001	73.8 µg/m ³	65.1 µg/m ³	349 µg/m ³	43

**TABLE D-7 Annual Criteria Pollutant Monitoring:
Mexicali, CBTIS**

Year	Arithmetic Mean	Geometric Mean	Highest Value	Number of Observations
CO 1-hour measurements				
1997	1.96 ppm	0.81 ppm	39.4 ppm	6,134
1998	2.09 ppm	0.98 ppm	41.8 ppm	7,896
1999	2.14 ppm	1.01 ppm	38.5 ppm	8,016
NO ₂ 1-hour measurements				
1997	0.0232 ppm	0.0173 ppm	0.167 ppm	6,440
1998	0.0240 ppm	0.0177 ppm	0.18 ppm	7,771
1999	0.0268 ppm	0.0196 ppm	0.199 ppm	5,498
2000	0.0211 ppm	0.0145 ppm	0.163 ppm	3,892
O ₃ 1-hour measurements				
1997	0.0636 ppm	0.0599 ppm	0.155 ppm	4,704
1998	0.0554 ppm	0.0517 ppm	0.194 ppm	7,212
1999	0.0567 ppm	0.0526 ppm	0.155 ppm	7,907
SO ₂ 1-hour measurements				
1997	0.0035 ppm	0.0004 ppm	0.056 ppm	4,352
1998	0.0026 ppm	0.0002 ppm	0.046 ppm	7,701
1999	0.0033 ppm	0.0003 ppm	0.056 ppm	7,336
PM ₁₀ 24-hour measurements				
1997	53.4 µg/m ³	49.5 µg/m ³	149 µg/m ³	46
1998	47.8 µg/m ³	40.9 µg/m ³	165 µg/m ³	58
1999	56.2 µg/m ³	49.8 µg/m ³	186 µg/m ³	61
2000	53.5 µg/m ³	47.5 µg/m ³	119 µg/m ³	58
2001	42.6 µg/m ³	37.5 µg/m ³	165 µg/m ³	40

**TABLE D-8 Annual Criteria Pollutant Monitoring:
Mexicali, COBACH**

Year	Arithmetic Mean	Geometric Mean	Highest Value	Number of Observations
CO 1-hour measurements				
1997	2.39 ppm	1.05 ppm	47.4 ppm	5,000
1998	2.49 ppm	1.08 ppm	48.4 ppm	7,956
1999	2.40 ppm	1.07 ppm	33.2 ppm	6,834
NO ₂ 1-hour measurements				
1997	0.0206 ppm	0.0142 ppm	0.168 ppm	4,972
1998	0.0209 ppm	0.0133 ppm	0.228 ppm	7,502
1999	0.0245 ppm	0.0163 ppm	0.221 ppm	7,710
2000	0.0237 ppm	0.0157 ppm	0.189 ppm	6,261
O ₃ 1-hour measurements				
1997	0.064 ppm	0.0596 ppm	0.168 ppm	4,557
1998	0.0702 ppm	0.0661 ppm	0.166 ppm	5,429
1999	0.068 ppm	0.0637 ppm	0.176 ppm	7,350
SO ₂ 1-hour measurements				
1997	0.0027 ppm	0.0008 ppm	0.033 ppm	4,536
1998	0.0024 ppm	0.0006 ppm	0.038 ppm	7,424
1999	0.0034 ppm	0.0008 ppm	0.101 ppm	6,821
PM ₁₀ 24-hour measurements				
1997	130.4 µg/m ³	111.1 µg/m ³	327 µg/m ³	30
1998	119.7 µg/m ³	102.3 µg/m ³	319 µg/m ³	46
1999	154.7 µg/m ³	132.2 µg/m ³	414 µg/m ³	61
2000	172.5 µg/m ³	156.8 µg/m ³	397 µg/m ³	55
2001	133.1 µg/m ³	115.5 µg/m ³	585 µg/m ³	40

